



**CHHATTISGARH STATE POWER DISTRIBUTION COMPANY LTD.**  
(A Government of Chhattisgarh Undertaking) (A Successor Company of CSEB)

CIN - U40108CT2003SGC015822

Office of Executive Director (O&M) CSPDCL Raipur [E-Mail-ceonm.raipur@cseb.gov.in](mailto:E-Mail-ceonm.raipur@cseb.gov.in)

No. 02-01 / WK-I / F.No.20 (Vol.9) / 1438

Raipur, Date 10/06/2016

To,

**The Executive Director / Chief Engineer**

[ (R/R) / (D/R) / (B/R) / (J/R) / (A/R) / (RAJ./R) / (STRE) ]

C. S. P. D. C. L. Raipur / Durg / Bilaspur / Jagdalpur / Ambikapur /  
Rajnandgaon Region

**Sub: - Schedule of Rates for the year 2016-17.**

—00—

The Schedule of Rates for the year 2016-17 has been finalized and soft copy of the same is being uploaded in the URJAINET of Power Company in CSPDCL's main page inside the Schedule of Rates folder as "Schedule of Rates 2016-17" which can be downloaded as per necessity.

As per practice in vogue from 2013-14, 9% Incidental charges (which include Building cess 1%, Bank interest 4%, Store incidental 2.5% and Commercial Tax 1.5%) has been continued. In addition to the above, Overhead Charges @ 11% (which include market fluctuation factor, Contractor's profit and service tax etc.) is also to be added in estimate. However the tender value of the work shall be based on Basic SoR estimate + 9% Incidental expenses only.

Similarly, for Special Category Remote Area such as Dantewada, Bijapur, Sukma and Narayanpur districts, 10% expenses on the overall cost of estimate shall be continued at the time of sanction of estimates.

It is requested to issue necessary instructions to all the officers up to the rank of JE under your jurisdiction to take necessary action as above. The Important Instructions which is a part of Schedule of Rates for the year 2016-17 is enclosed herewith for your ready reference. The new Schedule of Rates 2016-17 is applicable with immediate effect.

**Encl :- As above.**

  
**EXECUTIVE DIRECTOR (O&M)**  
**C.S.P.D.C.L., RAIPUR**

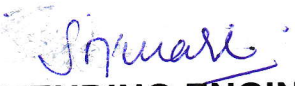
Copy to :-

1. The Superintending Engineer [ (O&M) / City ( I / II) / City ], CSPDCL Raipur / Durg / Mahasamund / Rajnandgaon / Bilaspur / Janjgir / Raigarh / Korba / Ambikapur / Jagdalpur / Kanker Circle

2. The Superintending Engineer (STRE) CSPDCL Raipur / Bilaspur / Jagdalpur Circle.

---- for information and necessary action.

Encl :- As above.

  
**SUPERINTENDING ENGINEER (W)**  
**O/o E.D. (O&M) C.S.P.D.C.L. RAIPUR**

# **CHHATTISGARH STATE POWER DISTRIBUTION COMPANY LTD.**

## **SCHEDULES OF RATES FOR THE YEAR 2016-17**

### **IMPORTANT INSTRUCTIONS TO BE FOLLOWED WHILE PREPARING ESTIMATES**

The schedule of rates have been prepared based on revision in the cost of materials, steel sections, civil work, labour & transportation charges etc., for applicability during the year 2016-17. Salient points relating to the schedule are briefly mentioned herewith.

1. The standard schedules of various works have been prepared and enclosed based on standard quantity. However, while preparing the estimates for any work, actual quantity required as per field conditions must only be taken in the schedule.
2. While preparing estimates, all the relevant codes like C.G. State Electricity Supply Code, C.E.A. (Technical Standards for construction of electrical plants and electric lines 2010, CEA (Safety requirements for construction, operation and maintenance of electrical plants and electrical lines regulations 2011, C.E.A. (installation and operation of meters, regulations 2006) with all amendments etc. are strictly to be followed.
3. (i) Estimates for 33 kV Lines should normally be framed with 9.1 Mtr / 11 Mtr long, 280 Kg / 365 Kg PCC pole. Use of H- Beams is restricted only to limited works in urban areas or difficult terrain.  
(ii) Similarly estimates for 11 KV lines should normally be framed with 8 Mtr / 9 Mtr / 9.1 Mtr / 11 Mtr long PCC poles as per requirements. Use of H- Beams / R.S. Joist is restricted only to limited works in urban areas or difficult terrains.  
(iii) Circular no. 6011 date 14.11.2013, No. 6408 date 19.12.2014, and guidelines issued vide this office letter No. 4808 date 08.12.2015 should be strictly followed.  
(iv) The order no. 02-11/IV-3/CTPT/3171 date 16.03.2016 issued by ED (HR) CSPDCL Raipur is to be strictly followed.
4. The earthing arrangement at 33/11 kV S/s should be made in accordance with the detailed guidelines circulated vide erstwhile MPEB's letter No. 08-01-STD-STATION EARTH-3574 Dtd. 21.05.1999.
5. The schedule of underground Railway / Road crossing on existing rail / road tracks (Sch.A-6) has been revised.

- (i) It is instructed that for the works which are carried out by CSPDCL at its own cost, laying of cable should be done using H.D.D. Technique only.
  - (ii) If Railway department applies for conversion of existing overhead line crossings to underground crossing, then schedules may be prepared as per their request.
6. New schedules namely A-10, AL-6, C-19 and C-20 have been introduced for Railway / Road crossing using Open Trench method, Labour schedule for A-10, Installation of R.M.U. and Chemical Earthing respectively.
7. (i) Schedule for Installation of Single Phase A.B. Switch on existing feeder outgoing D.P. from 33/11 kV Sub-station (Sch. B-7) has been deleted.
- (ii) Schedule for Single Pole mounted low capacity Single Phase 11/0.4 kV Distribution Transformer Sub-station of capacity 5 kVA & 10 kVA (Sch. C-13) has been deleted.
8. **Civil Works--**
- (i) The rates of the items of Civil works are indicated in Part-VIII of this booklet.
  - (ii) The assumptions made for preparing the standard schedules of lines include normal conditions of terrain and soil and do not apply to black cotton soil, for which simple base padding would not be adequate and concreting of the pole would be required. In case the geographical area is such that the line has to encounter river / railway crossing etc; the same is to be supplemented separately in the main technical estimate.
9. The rates of items, which do not find place in the enclosed list of materials, should be ascertained from the latest stores inventory or from the market. A specific mention to this effect should be made in the estimate, whenever such rates are used. Also cost schedule for Job wise labour rates for various maintenance work have been incorporated in schedule. The rates are proposed for normal soil conditions. In case of soft rock & hard rock, the rates of pit digging will be taken as two times and ten times respectively as compared to the rates applicable for normal soil.
10. The schedules are applicable only for the schemes relating to ND, Sub-transmission (Normal) and System Improvement works. For Deposit / Contributory works, while the cost of materials should be taken as in the schedule, the Supervision charges / service tax etc. may be computed as per the various relevant circulars in force.

11. As per the practice adopted in Schedule of Rates from year 2013-14, 9% Incidental charges (which include Building cess 1%, Work Charge Establishment 4%, Store incidental 2.5% and Commercial Tax 1.5%) has been continued. In addition to the above, Overhead Charges @ 11% (which include market fluctuation factor, Contractor's profit, service tax etc.) is also to be added which will not form the part of the Tender.



**EXECUTIVE DIRECTOR (O&M)**  
**CSPDCL: RAIPUR**

# CHHATTISGARH STATE POWER DISTRIBUTION COMPANY LTD.

No. 02-01/WK/

6011

Raipur, Date 14/11/2013

## CIRCULAR

At present 9.3 Mtr. Long Steel structure is being widely used for LT and 11 kV Line extension in city areas with AB Cable.

Now, it has been decided to use 200 kg, 9 Mtr. Long PCC Pole in place of 9.3 Mtr. Long Steel structure in urban areas where AB cable is being strung. How ever concreting of PCC Poles will have to be done during erection.

  
**CHIEF ENGINEER (O&M)**  
**C.S.P.D.C.L., RAIPUR**

Copy to:-

1. The Executive Director / Chief Engineer [(R/R) / (D/R) / (B/R) / (J/R) / (RJN/R) / (A/R)], C.S.P.D.C.L. Raipur / Durg / Bilaspur / Jagdalpur / Rajnandgaon / Ambikapur Region.
2. The Chief Engineer [(S&P) / (ST-RE)] C.S.P.D.C.L. Raipur.
3. The Superintending Engineer [(O&M) / (City-I / II)] Circle, CSPDCL

  
**ADDL. CHIEF ENGINEER (W)**  
**O/o C.E. (O&M) C.S.P.D.C.L. RAIPUR**

(A Government of Chhattisgarh under Taking (A Successor Company of C.S.E.B.)

CIN UF0A08CTT2003SGC015822

Office of the Executive Director (O&M) CSPDCL, Email ID ceonm.raipur@cseb.gov.

NO. 02-01/Works/LT cable/

6408

Raipur, Dated

19/12/2014

To,

The Executive Director/Chief Engineer(..... Region)

CSPDCL, .....

Sub:- IS 14255 regarding specification of Aerial Bunched cables for working voltage upto and including 1100 Volts.

Please refer to IS 14255, a copy of which is enclosed herewith. As per Para6.4 of this code, "The size of street light conductor shall be 16 Sqmm". The provision in the estimate is to be made according to this IS code, where the work for street light is being proposed.

Encl:- As above.

  
**EXECUTIVE DIRECTOR (O&M)**  
**CSPDCL; RAIPUR**

IS 14255 : 1995

भारतीय मानक

वायवीय गुच्छित केबल — 1 100 वोल्ट तक और सहित की  
कार्यवारी वोल्टता के लिए — विशिष्ट

*Indian Standard*

**AERIAL BUNCHED CABLES — FOR WORKING  
VOLTAGES UP TO AND INCLUDING  
1 100 VOLTS — SPECIFICATION**

UDC 621-315-211 ( 621-315-616-96 ) : 621-396-67

© BIS 1995

**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002



## FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Power Cables Sectional Committee had been approved by the Electrotechnical Division Council.

This standard specifies the requirement of Polyethylene/crosslinked polyethylene insulated cables with aluminium conductors twisted over a central bare/insulated aluminium alloy messenger wire for use as overhead distribution feeders for rated voltages up to and including 1100 V.

Many countries are now increasingly using cables with insulated conductor for LT overhead lines. This system is commonly called ABC system ( Aerial Bunched Cables ).

In the ABC system, the insulated conductors ( 3 or 4 numbers as required ) are twisted around a high strength aluminium alloy bearer wire, which carries the main weight and also serves as the earth-cum-neutral wire. The bearer wire ( messenger ) may be bare or insulated. The phase conductors are not under tension.

The system is very safe and LT faults are practically eliminated. Consequently, interruptions of supply are minimized and the life of transformers is considerably increased as these are not subjected to frequent faults as happens with the bare conductors. The problem of tree clearance is also minimized.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values ( revised )'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# Indian Standard

## AERIAL BUNCHED CABLES — FOR WORKING VOLTAGES UP TO AND INCLUDING 1 100 VOLTS — SPECIFICATION

### SECTION 1 GENERAL

#### 1 SCOPE

1.1 This standard covers the requirements of polyethylene/crosslinked polyethylene insulated cables with aluminium conductors, twisted over a central bare/insulated aluminium alloy messenger wire for use as overhead distribution feeders.

1.2 The cables covered in this standard are suitable for use on three phase ac (earthed or unearthed) system, for rated voltage up to and including 1 100 V.

NOTE— The cables conforming to this standard may be operated continuously at a power frequency voltage 10 percent higher than the rated voltage.

1.3 The cables covered in this standard are suitable for use where the combination of ambient temperature and temperature rise due to load, including temperature on exposure to direct sunlight results in conductor temperature not exceeding the following:

Type of Insulation	Normal Continuous Operation	Short Circuit Operation
Polyethylene	70°C	160°C
Crosslinked polyethylene	90°C	250°C

#### 2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

IS No.	Title
398 (Part 4): 1979	Aluminium conductors for overhead transmission purposes: Part 4 Aluminium alloy stranded conductors (aluminium-magnesium-silicon type) (second revision)
1885 (Part 32): 1993	Electrotechnical vocabulary: Part 32 Electric cables (first revision)
8130 : 1984	Conductors for insulated electric cables and flexible cords (first revision)
10418 : 1982	Drums for electric cables
10810 (series)	Methods of test for cables. (The relevant part numbers are given in col 4 of 10.1)

#### 3 TERMINOLOGY

3.0 For the purpose of this standard the following

definitions, in addition to those given in IS 1885 (Part 32): 1993 shall apply.

#### 3.1 Routine Tests

Tests made by the manufacturers on all finished cable lengths to demonstrate the integrity of the cables.

#### 3.2 Type Test

Tests required to be made before supply on a general commercial basis on a type of cable in order to demonstrate satisfactory performance characteristics to meet the intended application.

NOTE— These tests are of such a nature that after they have been made, they need not be repeated unless changes are made in the cable materials or design which might change the performance characteristics.

#### 3.3 Acceptance Tests

Tests carried out on samples taken from a lot for the purpose of acceptance of the lot.

#### 3.4 Optional Tests

Special tests to be carried out, when required by agreement between the purchaser and the supplier.

#### 3.5 Earthed System

An electric system which fulfills any of the following conditions:

- a) The neutral point or mid point connection is earthed in such a manner that even under fault conditions, the maximum voltage that can occur between any conductor and earth does not exceed 80 percent of the nominal system voltage;
- b) The neutral point or mid point connection is not earthed but a protective device is installed which automatically cuts out any part of the system which accidentally becomes earthed; or
- c) In case of ac system only, the neutral point is earthed through an arc suppression coil with arrangement for isolation within 1 hour of occurrence of the fault provided that total of such periods in a year does not exceed 125 hours.

#### 3.6 Unearthed System

An electric system which does not fulfil the requirements of earthed system (see 3.5).

## SECTION 2 MATERIALS

## 4 CONDUCTOR

## 4.1 Phase/Street Lighting Conductor

The conductor shall be of H2 or H4 grade aluminium complying with the requirements of IS 8130 : 1984.

## 4.2 Messenger (Neutral Conductor or Otherwise)

The conductor shall be of heat treated aluminium-mag-

nesium-silicon alloy wires containing approximate 0.5 percent magnesium and approximately 0.5 percent silicon conforming to IS 398 (Part 4) : 1979.

## 5 INSULATION

5.1 The insulation shall be either of cross-linked polyethylene compound or of polyethylene compound, conforming to requirement given in Tables 1 and 2 respectively.

Table 1 Properties of XLPE Insulation

(Clause 5.1)

Sl No.	Tests	Requirements
(1)	(2)	(3)
i)	Tensile strength	12.5 N/mm <sup>2</sup> , <i>Min</i>
ii)	Elongation at break	200 percent, <i>Min</i>
iii)	Ageing in air oven:	
	a) Treatment : Temperature	135 ± 3°C
	Duration	7 days
	b) Tensile strength variation	±25 percent, <i>Max</i>
	c) Elongation variation	±25 percent, <i>Max</i>
iv)	Hot set:	
	a) Treatment : Temperature	200 ± 3°C
	Time under load	15 min
	Mechanical stress	20 N/cm <sup>2</sup>
	b) Elongation under load	175 percent, <i>Max</i>
	c) Permanent elongation (set) after cooling	15 percent, <i>Max</i>
v)	Shrinkage:	
	a) Treatment : Temperature	130 ± 3°C
	Duration	1 hour
	b) Shrinkage	4 percent, <i>Max</i>
vi)	Water absorption (Gravimetric):	
	a) Treatment : Temperature	85 ± 2°C
	Duration	14 days
	b) Water absorbed	1 mg/cm <sup>2</sup> , <i>Max</i>
vii)	Volume resistivity:	
	a) at 27°C	1 × 10 <sup>13</sup> ohm-cm, <i>Min</i>
	b) at 70°C	1 × 10 <sup>11</sup> ohm-cm, <i>Min</i>
viii)	Carbon black:	Under consideration
	a) Content	
	b) Dispersion	

Table 2 Properties of PE Insulation  
(Clause 5.1)

SI No.	Property	Requirements
i)	Volume resistivity:	
	a) at 27°C	$1 \times 10^{14}$ ohm-cm, <i>Min</i>
	b) at 70°C	$1 \times 10^{12}$ ohm-cm, <i>Min</i>
ii)	Tensile strength	10 N/mm <sup>2</sup> , <i>Min</i>
iii)	Elongation at break	300 percent, <i>Min</i>
iv)	Melt flow index	3, <i>Max</i>
v)	Vicat softening point	85°C, <i>Min</i>
vi)	Carbon black:	
	a) Content	Under consideration
	b) Dispersion	Under consideration
vii)	Environmental stress cracking	No cracks shall be visible to naked eye

### SECTION 3 CONSTRUCTION

#### 6 CONDUCTOR

6.1 The power/outer insulated neutral/street lighting conductors shall conform to flexibility class 2 of IS 8130 : 1984.

6.2 The messenger (Neutral conductor) or otherwise shall be either stranded circular or compacted circular type and shall have minimum 7 strands. The surface of the conductor shall be smooth.

6.3 A protective barrier may be applied between the conductor and insulation, if required. Such barrier, when used, shall be compatible with insulating material and suitable for the operating temperature of the cable.

6.4 The size of street lighting conductor shall be 16 mm<sup>2</sup>.

6.5 The size of messenger conductor and its breaking load shall be as per Table 3.

6.6 There shall be no joints in any wire of the messenger conductor except those made in the base rod or wires before final drawing. The direction of outer layer of wires in messenger conductor shall be right hand.

#### 7 INSULATION

7.1 The conductor (with protective barrier, wherever applied) shall be provided with crosslinked polyethylene or polyethylene insulation applied by extrusion.

Table-3 Size and Requirements of Messenger Conductor  
(Clause 6.5)

SI No.	Nominal Cross Sectional Area of Phase Conductor	Messenger Conductor		
		Nominal Cross Sectional Area	Maximum dc Resistance at 20°C	Minimum Breaking Load
	mm <sup>2</sup>	mm <sup>2</sup>	ohm/km	kN
(1)	(2)	(3)	(4)	(5)
i)	16	25	1.38	7.0
ii)	25	25	1.38	7.0
iii)	35	25	1.38	7.0
iv)	50	35	0.986	9.8
v)	70	50	0.689	14.0
vi)	95	70	0.492	19.7

7.2 Thickness of Insulation

The average thickness of insulation shall be not less than the nominal value ( $t_n$ ) specified in Table 4.

Table 4 Thickness of Insulation

Nominal Area of Conductor mm <sup>2</sup>	Nominal Thickness ( $t_n$ ) mm
(1)	(2)
16	1.2
25	1.2
35	1.2
50	1.5
70	1.5
95	1.5

7.3 Tolerance on Thickness of Insulation

The smallest of measured values of thickness of insulation shall not fall below the nominal value ( $t_n$ ) specified in Table 4 by more than  $0.1 \text{ mm} + 0.1 (t_n)$ .

7.4 Application of Insulation

The insulation shall be so applied that it fits closely on the conductor (or barrier, if any) and it shall be possible to remove it without damaging the conductor.

7.5 The colour of insulation shall be black.

8 CORE IDENTIFICATION

8.1 The phase conductors shall be provided with one, two or three 'ridges' and outer neutral insulated conductor, if provided, shall have four 'ridges' as shown in Fig. 1 for quick identification. The street lighting conductor and messenger conductor (if insulated) shall not have any identification mark.

8.2 Identification by other means, as agreed between the supplier and purchaser, is also permissible.

9 ASSEMBLY (LAYING UP)

9.1 Three insulated phase conductors, one insulated neutral conductor (if required) and a street lighting conductor (if required) shall be twisted around the bare (or insulated) as required messenger conductor without fillers with a lay not exceeding 35 times the diameter of the insulated phase conductor.

9.2 The direction of lay shall be right hand.

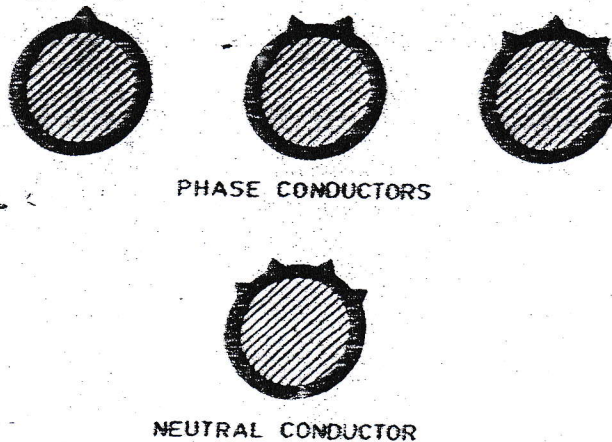


FIG. 1 CORE IDENTIFICATION

O/o CE (EITC)  
Receipt No. 12039  
Date 10 DEC 2015  
DGM (IT) / SE (O)  
EE. W. b.  
Section

CHHATTISGARH STATE POWER DISTRIBUTION COMPANY LIMITED  
OFFICE OF THE EXECUTIVE DIRECTOR (O&M)  
(A GOVT. OF CHHATTISGARH UNDERTAKING)  
(A SUCCESSOR COMPANY OF CSEB)

No. 702-01/Work-I/ 15-60/ 4808

Raipur, Dated 08/12/2015

10/12

10/11

11/12

To,

The Executive Director/Chief Engineer(-----R)/ -----  
The Superintending Engineer -----  
The Executive Engineer -----  
C.S.P.D.C.L  
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Sub :- Guidelines regarding use of Steel / PCC Supports.

While Scrutiny of various works estimate it is noticed that uniformity in preparation of estimates of laying LT/11KV/33KV lines in respect of use of supports is not maintained and instructions issued by this office are not being followed. In many cases estimates under various schemes have been found prepared on steel supports of various types/sizes even in rural areas. Use of steel supports, if technically not required, results in to higher cost of estimates unnecessarily without adding any extra benefit. Our SOR has provision of H Beam, RSJ, various sizes of PCC Poles. While preparing estimates by field officers the type & sizes of supports needs to be considered based on various technical/safety requirements. It is clearly mentioned in the Para VII (a), (b) & (c) of preface of approved SOR 15-16 about the supports to be used in various types of LT/HT lines (Copy enclosed). Similarly instructions were issued by T.O. vide circular no. 6011 dt. 14.11.2013. It is there fore once again instructed to adhere to the guidelines mentioned in Para VII (a), (b) & (c) & Circular no. 6011 dt. 14.11.2013 while preparing the estimates. If it is necessary to use steel support instead of suitable size PCC Pole due to some technical/safety requirements, then it needs to be clearly mentioned in the history & scope of the estimate with proper reasons.

Any deviations from the instructions as mentioned above will be viewed seriously.

Encl: As above.

EXECUTIVE DIRECTOR (O&M)  
CSPDCL, RAIPUR

Copy to :-

1. The CE / SE / EE / (STRE) CSPDCL ..... for information & necessary action please.
2. The CE (EITC) CSPDCL, Raipur. It is requested to upload a copy on Urjainet, Public Document.